

**REMARKS/ARGUMENTS**

**Claim 21 is rejected under 35 USC 102e as being anticipated by Ji (US 2005/0073607);**

**Claims 1 and 3-20 are rejected under 35 USC 103a as being unpatentable over**

**Campbell (US 6133957) in view of Hahn (US 7092033);**

5 **Claim 2 is rejected under 35 USC 103a as being unpatentable over Campbell in view of Hahn as applied above to claim 1, and further in view of De Haan (PCT Pub WO03/038753, also published as US 7206027); and**

**Claim 22 is rejected under 35 USC 103a as being unpatentable over Ji as applied to claim 21 above, and further in view of Yamashita (US 5347599)**

10 Claims 1-22 are cancelled without prejudice or disclaimer to the subject matter thereof.

**New Claims**

New claims 23 to 38 are added. No new matter is entered. Comments providing support for each new claim and concerning the patentability of the new claims with regards to the  
15 cited references are provided in the below paragraphs.

New independent claims 23 and 31

Concerning support for the units of claim 23, the applicant firstly points to figure 2 of the present invention as filed showing the claimed structure of the pixel\_diff\_1 unit 206, the  
20 pixel\_diff\_2 unit 208, the angle checking unit 210, and the weighted blending unit 216.

Concerning support for the claimed operation of the first pixel difference unit, paragraph [0031] states, “on either side of the normal axis 150, a pair of pixel sets (or a corresponding angle), which results in two angle values coming out of the first pixel difference unit 206”. More details are provided at the end of paragraph [0036] stating, “As such, two angle values,  
25  $\Theta_1$  on the right side (which corresponds to a right pixel difference Right\_Pixel\_Diff), and  $\Theta_2$  on the left side (which corresponds to a left pixel difference Left\_Pixel\_Diff) of the normal axis 150, are determined.” The applicant points out that none of the cited references teach or suggest a first pixel difference unit for determining two candidate blending angles according

to pixel difference values on either side of a normal axis of a target pixel.

Concerning support for the claimed operation of the second pixel difference unit, paragraph [0038] states, “the second pixel difference unit 208 performs the following operation, which may be termed as ‘reference pixel difference algorithm’, to render a second pixel difference set which includes two reference pixel differences Right\_Ref\_Diff and Left\_Ref\_Diff.” Additionally paragraph [0043] indicates that the reference angle is 45 degrees in one embodiment “wherein Right\_Ref\_Diff ... of a pair of pixel sets ... along an angle on the right side of the normal axis 150 (here, 45 degrees,) whereas Left\_Ref\_Diff along an angle on the left side of the normal axis 150 (here, -45 degrees.)” The applicant points out that none of the cited references teach or suggest a second pixel difference unit for determining two reference pixel differences in the image field being along a reference angle on either side of the normal axis of the target pixel.

Concerning support for the claimed operation of the angle selection unit, paragraph [0045] states, “After the operations of the first pixel difference unit 206 and the second pixel difference unit 208, at least the parameters Right\_Pixel\_Diff (which corresponds to  $\Theta_1$ ) Left\_Pixel\_Diff (which corresponds to  $\Theta_2$ ) Right\_Ref\_Diff, and Left\_Ref\_Diff are passed to the angle checking and correcting unit 212, and the angle checking and correcting unit 212 will operate, according to these parameters, in conjunction with the operation of the angle voting unit 214, to determine an optimal angle Opt\_Angle.” The applicant points out that none of the cited references teaches an angle selection unit for determining an optimal blending angle according to two candidate angles and two reference pixel differences.

Concerning support for the claimed operation of the weighted blending unit, paragraph [0096] stating, “the weighted blending unit 216 operates to weighted blend (or interpolate) pixel information along the selected optimal angle Opt\_Angle”. The applicant again points out that none of the cited references teach such operation because the optimal angle determined by the present invention is not taught or suggested by the cited references.

Therefore, for at least the reasons shown about that none of the cited references teach or suggest the specific claimed features of the present invention, new independent claim 23

should be found allowable with respect to the cited references. A similar argument also applies to new independent claim 31, which is a corresponding method claim. Dependent claims 24-30 and 32-38 should be found allowable for at least the same reasons as their respective base claim. Further comments regarding support and patentability for the  
5 dependent claims are provided in the following paragraphs.

#### Claims 24 and 32

Concerning support for claim 24, the applicant points out that figure 2 also shows the gradient unit 204, and paragraph [0021] states, “the gradient unit 204 first operates to  
10 determine if the gradient of pixel values in the upper line (eg the line 11) and the gradient of pixel values in the lower line (eg the line 130) of a current pixel to be interpolated (eg the additional pixel 125) posses certain characteristics.” Also, paragraph [0029] explains that the first pixel difference unit generates the two angles according to the gradient stating, “After the value of the parameter Gradient has been determined, the first pixel difference unit 206 will  
15 operate to calculate a first pixel difference set, and to determine two angles, one on either side of the normal axis 150, according to the parameter Gradient as well as the first pixel difference set.” The applicant points out that none of the cited references teach calculating the gradient and then determining the two candidate angles on either side of the normal axis by the first pixel difference unit also according to the gradient. A similar argument also applies  
20 to corresponding method claim 32.

#### Claims 25 and 33

Concerning support for claim 25, as quoted above, paragraph [0043] indicates that the reference angle is 45 degrees in one embodiment “wherein Right\_Ref\_Diff ... of a pair of  
25 pixel sets ... along an angle on the right side of the normal axis 150 (here, 45 degrees,) whereas Left\_Ref\_Diff along an angle on the left side of the normal axis 150 (here, -45 degrees.)” The applicant points out that none of the cited references teach calculating the two reference pixel differences along an angle of 45 degrees on either side of the normal axis of

the target pixel. The applicant also notes that neither vertical nor horizontal angles of interpolation are equivalent or similar to an angle of 45 degrees on either side of the normal axis. A similar argument also applies to corresponding method claim 33.

5     Claims 26 and 34

Concerning support for claim 26, the applicant points out that figure 2 shows the angle selection unit 210 including the angle voting unit 214. Additionally, paragraph [0045] states, “in conjunction with the operation of the angle voting unit 214, to determine an optimal angle Opt\_Angle. The angle voting unit 214 operates to compare an angle at issue together with  
10     two stored angles, Pre\_Angle and Pre\_Pre\_Angle, from the checking and correcting operation corresponding to two previous pixels”. Also see, for example, paragraph [0058] and paragraph [0066] detailing how the two previously utilized blending angles Pre\_Angle and Pre\_Pre\_Angle are utilized by the angle voting unit 214 when determining the optimal  
15     blending angle. The applicant notes that none of the cited references teach determining the optimal blending angle utilizing two previously determined blending angles respectively corresponding to two previously blended pixels. A similar argument also applies to corresponding method claim 34.

Claims 27 and 35

20     Concerning support for claim 27, the applicant points to paragraph [0096] stating, “the weighted blending unit 216 operates to weighted blend (or interpolate) pixel information along the selected optimal angle Opt\_Angle and pixel information along the normal axis, so as to render the pixel to be interpolated.” The applicant again points out that none of the cited references teach such operation because the optimal angle determined by the present  
25     invention is different than that taught by the cited references. A similar argument also applies to corresponding method claim 34, and claims 27 and 25 are dependent claims and should be found allowable for at least the same reasons.

Claims 28 and 36

Concerning support for claim 28, the applicant points out that paragraph [0096] states, “The pixel information along the optimal angle and the normal axis is weighted according certain weighting algorithm, and in this embodiment, a two-phase weighting algorithm is  
5 used in the weighted blending unit 216.” The applicant points out that in addition to the fact that none of the cited references teach the same optimal angle as the present invention, the two-phase weighting algorithm of the present invention is also different. A similar argument also applies to corresponding method claim 36.

10 Claims 29 and 37

Concerning support for claim 29, see figure 2 showing the low-pass filter (LPF) 202 and paragraph [0018] stating, “The purpose of adopting a low-pass filtering operation before any further processing to the incoming data usually includes noise suppression or image  
smoothing.” The applicant asserts that claims 29 and 37 should be found allowable for at  
15 least the same reasons as base claims 23 and 31, respectively.

Claims 30 and 38

Concerning support for claim 30, paragraph [0038] states, “the second pixel difference unit 208 also operates to generate a second pixel difference set, according to an alternative  
20 pixel difference algorithm than the first pixel difference unit 206.” The applicant asserts that claims 30 and 38 should be found allowable for at least the same reasons as base claims 23 and 31, respectively.

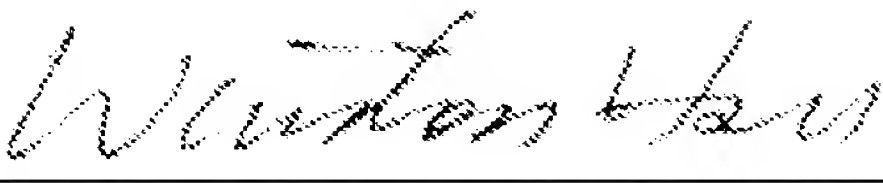
**Conclusion**

25 Thus, all pending claims are submitted to be in condition for allowance with respect to the cited art for at least the reasons presented above. The Examiner is encouraged to telephone the undersigned if there are informalities that can be resolved in a phone conversation, or if the Examiner has any ideas or suggestions for further advancing the

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prosecution of this case.

Sincerely yours,

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